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10/767,399	01/29/2004	Chirag Deepak Dalal	VRT0129US	2875

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EXAMINER
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KROFCHECK, MICHAEL C

ART UNIT	PAPER NUMBER
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2186

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/767,399	<b>Applicant(s)</b> DALAL ET AL.	
	<b>Examiner</b> MICHAEL C. KROFCHECK	<b>Art Unit</b> 2186	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-14 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-14 and 16-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This office action is in response to the RCE filed on 7/14/2008.
2. Claims 1 and 13 have been amended.
3. The objections/rejections from the prior correspondence not restated herein have been withdrawn.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 1-2, 4-14, 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bridge (6405284), Vishlitzky et al. (5819310), and Soejima et al., (2003/0074528).

Art Unit: 2186

7. With respect to claim 1 and 13, Bridge teaches of a medium for storing computer executable instructions, wherein a method is performed in response to executing the instructions (column 26, line 55-column 27, line 44); the method comprising: in response to a request to perform a plurality of operations on a plurality of logical volumes, identifying a first storage region of a plurality of storage regions available for allocation for a first operation of the plurality of operations on a first logical volume of the plurality of logical volumes (fig. 11, item 1102; column 1, lines 35-51; column 19; lines 24-61);

Vishlitzky teaches of a mirrored set, mirroring data from one logical volume to another (fig. 1; column 6, lines 25-40; thus multiple logical volumes);

The combination of Bridge and Vishlitzky teaches of determining whether each of the remaining operations of the plurality of operations can be performed on the remaining volumes of the plurality of logical volumes using one or more subsets of the plurality of storage regions, wherein the one or more subsets exclude the identified first storage region (Bridge, fig. 11, items 1106; column 1, lines 35-51; column 19; lines 24-61).

allocating the first storage region for the first operation (fig. 11; column 19, lines 24-45).

Bridge fails to explicitly teach of allocating the first storage region for the first operation after performing said identifying and said determining, if said determining determines that each of the remaining operations can be performed.

However, Soejima teaches of allocating the first storage region for the first operation after performing said identifying and said determining, if said determining determines that each of the remaining requirements can be satisfied (fig. 4; paragraph 43-44).

It would have been obvious to one of ordinary skill in the art having the teachings of Bridge and Vishlitzky at the time of the invention to include locating the full mirrored partners on different logical volumes from each other. Their motivation would have been to facilitate reading operations from a mirrored pair of drives (Vishlitzky, column 4, lines 39-41).

It would have been obvious to one of ordinary skill in the art having the teachings of Bridge, Vishlitzky, and Soejima at the time of the invention to determine if requirements for full mirror partners to a primary extent are satisfied before allocating the primary extent in the combination of Bridge and Vishlitzky as suggested in Soejima. Their motivation would have been to streamline the allocation process, increasing efficiency and performance (Soejima, paragraph 15-16).

8. With respect to claim 2 and 14, the combination of Bridge, Vishlitzky, and Soejima teaches of if said determining determines that each of the remaining operations cannot be performed using the one or more subsets of the plurality of storage regions, identifying a third storage region of the plurality of storage regions available for allocation for the first operation (Bridge, fig. 11; column 1, lines 35-51; column 19; lines 24-61; as when a sufficient mirror partner cannot be found, the primary extent is deallocated and a new primary parity extent is selected at 1102 again), and

determining whether each of the remaining operation of the plurality of operations can be performed using a one or more subsets of the plurality of storage regions, wherein the one or more subsets exclude the third storage region and include the first storage region (fig. 11, items 1106; column 1, lines 35-51; column 19; lines 24-61).

9. With respect to claim 4 and 16, the combination of Bridge, Vishlitzky, and Soejima teaches of identifying a respective set of rules to configure each respective logical volume of the plurality of logical volumes prior to identifying the first storage region, wherein the respective set of rules for each respective logical volume is used to identify a respective storage region to allocate for the respective logical volume (Bridge, fig. 11; column 19, lines 40-44; the round robin algorithm is used to distribute the location of the extents across the disk drives).

10. With respect to claim 5 and 17, the combination of Bridge, Vishlitzky, and Soejima teaches of wherein the determining whether each of the remaining operations can be performed comprises examining a second respective set of rules for a second logical volume of the plurality of logical volumes (Bridge, fig. 11; column 19, lines 45-54; the other extents must be located in only the full mirror partners).

11. With respect to claim 6 and 18, Bridge teaches of determining a respective storage region to allocate for each respective operation of the set of operations by determining whether a remaining operation of the set of operations can be performed using an unallocated subset of the plurality of storage regions, wherein the remaining operation excludes the respective operation, the unallocated subset excludes the respective storage region, and the unallocated subset excludes an allocated subset of

Art Unit: 2186

the plurality of storage regions wherein each storage region in the allocated subset is allocated to one of the set of operations (fig. 11; column 19, lines 24-61).

12. With respect to claim 7 and 19, Bridge teaches of wherein each operation of the set of operations is one type of operation (fig. 11; column 19; lines 24-61; the first operation is a parity extent allocation; the second operation is a data extent allocation, the third operation is a store of management information).

13. With respect to claim 8 and 20, Bridge teaches of wherein a first operation of the set of operations is a first type of operation (fig. 11; column 19; lines 24-61; the first operation is a parity extent allocation),

a second operation of the set of operations is a second type of operation (fig. 11; column 19; lines 24-61; the second operation is a data extent allocation), and

the first type and the second type are different (fig. 11; column 19; lines 24-61; the parity extent allocation is different from the data extent allocation as there are different requirements that must be fulfilled. Additionally, the store of management information can also be interpreted as a second operation).

14. With respect to claim 9 and 21, Bridge teaches of wherein the first storage region conforms to a first intent of the first logical volume (fig. 11; column 19, lines 24-27, lines 40-44; the location for the parity extent is selected based on the round robin algorithm. Doesn't any storage region that is a logical volume conform to the intent of that logical volume. It must satisfy the requirements of the logical volume to be allocated as the logical volume).

Art Unit: 2186

15. With respect to claim 10 and 22, Bridge teaches of wherein the first intent comprises a first rule used to configure the first storage region to provide the first logical volume (fig. 11; column 19, lines 24-27, lines 40-44; the round robin algorithm (first rule) is used to select the storage location for the parity extent).

16. With respect to claim 11 and 23, Bridge teaches of performing the first operation on the first logical volume using the first storage region (fig. 11, items 1102, 1104; column 1, lines 35-51; column 19; lines 24-61).

17. With respect to claim 12 and 24, Bridge teaches of wherein one operation of the set of operations is one of the following: creating the first logical volume; growing a second logical volume of the plurality of logical volumes; and adding a mirror to a third logical volume of the plurality of logical volumes (fig. 8, 9, 10a, 19, items 802-804, 910, 1004 respectively; column 16, lines 33-47; column 17, lines 27-34; column 17, lines 62-66; column 26, lines 57-65).

### ***Response to Arguments***

18. Applicant's arguments filed 7/14/2008 have been fully considered but they are not persuasive.

19. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the claimed allocating **only** occurs if the determining limitation determines that each of the remaining operations can be performed (applicant's remarks 7/14/2008 bottom of page 9)) are not recited in the rejected claim(s). Although the claims are



Art Unit: 2186

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

20. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

21. Applicant argues with respect to independent claims 1 and 13 that Bridge discloses allocation of the primary extent before evaluation of the free space, whereas the claim indicates the allocating occurs after determining whether or not the remaining operations can be performed.

The examiner points out that this is discussed in the rejection of the independent claims under 35 USC § 103 (a) referring to the combination of Bridge, Vishlitzky, and Soejima, referencing Bridge and Soejima specifically on previous pages 3 and 4 where Soejima is relied upon to teach allocating the first storage region for the first operation after performing said identifying and said determining if said determining determines that each of the remaining requirements can be satisfied (fig. 4; paragraphs 43-44).

22. In response to applicant's argument that incorporating Soejima into Bridge would allegedly render Bridge inoperative, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references

Art Unit: 2186

would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Applicant's argument with respect to the independent claims that it is not permissible to combine Bridge with Soejima in the combination of Bridge, Vishlitzky, and Soejima, as it would allegedly render Bridge inoperative and that Bridge and Soejima are nonanalogous arts. The examiner disagrees with this reasoning for the following reasons:

- a. The invention of Bridge is directed towards, "improved load balancing, reduction or elimination of fragmentation, and efficient incremental addition of disk drives," (column 3, lines 10-15). By changing the order of steps of the allocation of Bridge (fig. 11) to reflect Soejima's allocating the first storage region for the first operation after identifying a storage region and determining that each of the remaining requirements can be satisfied (fig. 4; paragraph 43-44), the improved load balancing, reduction or elimination of fragmentation, and efficient incremental addition of disk drives as intended by Bridge would still occur. Furthermore, as evidenced by Soejima paragraph 15-16, this would occur in a far more efficient manner, boosting the performance of the combination. Furthermore the applicant has not submitted any evidence indicating that it would be impossible for Bridge to operate in the manner suggested by the combination of Bridge, Vishlitzky, and Soejima.
- b. The invention of Bridge is directed to the field of "managing storage systems containing multiple data storage devices," Bridge column 1, lines 6-10.

Art Unit: 2186

Specifically including the allocation of extents. Soejima's invention is also in the field of storage volume management, specifically, "a volume management method for defining a volume on a physical storage device of a storage apparatus," Soejima paragraph 1. Soejima goes on to teach of ensuring the requested access times of operations of all previous volumes are satisfied before creating an additional volume (fig. 4; paragraph 44).

c. While not the exact same inventive applications, Ex parte Rubin, 128 USPQ 440 (Bd. App. 1959) is analogous to this situation. Changing the order of steps in Bridge, discussed above, does not render bridge inoperable, but causes it to achieve the desired results in a more efficient manner with better performance.

From MPEP 2144.04: Ex parte Rubin discusses a prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps. See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946), the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results.

23. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention

Art Unit: 2186

where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, one of ordinary skill in the art would have been motivated to combine Bridge and Vishlitzky by including the locating the full mirrored partners on different logical volumes from each other of Vishlitzky into Bridge in order to facilitate reading operations from a mirrored pair of drives (Vishlitzky, column 4, lines 39-41).

In this case, one of ordinary skill in the art would have been motivated to combine the combination of Bridge and Vishlitzky, and Soejima by determining if there are adequate full mirror partners to a primary extent before allocating the primary extent in the combination of Bridge and Vishlitzky as taught in Soejima in order to streamline the allocation process, increasing efficiency and performance (Soejima, paragraph 15-16).

### **Conclusion**

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL C. KROFCHECK whose telephone number is (571)272-8193. The examiner can normally be reached on Monday - Friday.

25. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2186

26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHAEL C KROFCHECK/  
Examiner, Art Unit 2186

/Tuan V. Thai/  
Primary Examiner, Art Unit 2186

Michael C. Krofcheck